

## **REMARKS**

This letter is responsive to the office action dated April 21, 2003. Claims 1-29 remain in this application. Claims 1-3, 8-9, 11, 17, 19-21, 23-27, and 29 have been amended. The Applicants submit that each of claims 1-29 is now in condition for allowance.

### **35 U.S.C. § 101 rejection**

In paragraph 1 of the office action, the Examiner has rejected claims 1-19 and 24-29, as being directed to non-statutory subject matter, particularly, an abstract idea. The claims have been amended to clarify that the underlying methods are computer-implemented in the context of a risk management system. In at least one step of the methods, information is stored in a database. Furthermore, at least one step of the methods is performed by an aggregation engine, which produces at least one risk metric for use in risk management.

Accordingly, the Applicants submit that the claims as amended describe subject matter that is more than an abstract concept without physicality, and respectfully request that this rejection be withdrawn.

### **35 U.S.C. § 103 rejection**

In paragraph 2 of the office action, the Examiner has rejected claims 1-10 and 15-29 as being unpatentable over **Dembo** (U.S. Patent No. 5,148,365) in view of **Moore et al.** (U.S. Patent No. 5,446,885). Furthermore, the Examiner has rejected claims 11-14 as being unpatentable over **Dembo** and **Moore et al.**, and further in view of **Ohata et al.** (U.S. Patent No. 5,864,857).

The Applicants respectfully submit that the combination of elements claimed would not be considered obvious by a person skilled in the art in view of the cited references, taken alone or in combination, for the reasons provided below.

First, the present invention determines risk values at an instrument level instead of at a portfolio level, as was the case with the prior art. The Applicants submit that prior art risk management systems performed risk analysis on entire portfolios, because the interactions between instruments in the portfolio were perceived to be too complex to permit risk values to be determined at an instrument level. Furthermore, it was often considered impossible to isolate the specific risk factors that would have the largest effects on the overall risk of the portfolio. As a result, if a subset of the portfolio was to be analyzed, or if the portfolio were to undergo changes, the Applicants submit that prior art risk management systems would re-perform the risk analysis on the entirety of the subset or the changed portfolio. The Applicants submit that prior to the present invention, those of ordinary skill in the art would have understood that it was necessary to re-perform the analysis in this manner in order to ensure that the

complex co-dependencies between the instruments in the given subset or changed portfolio would be captured.

In contrast, the Applicants' invention is directed to an innovative framework in which risk values are determined at an instrument level. In accordance with the invention, instrument risk values are determined and stored for later re-use. More specifically, in computing desired risk metrics for a given portfolio of instruments, the invention does not involve merely storing and retrieving individual instrument risk values, nor are the instrument risk values retrieved and combined in various arbitrary permutations and combinations, as may be suggested at page 6 of the office action. Instead, the present invention employs the use of an aggregation engine to retrieve stored instrument risk values for each scenario and at each time interval for instruments in a portfolio of interest, and combine the retrieved values to obtain aggregated risk values at the portfolio level. The aggregated risk values for the portfolio of interest can then be subsequently used to compute desired risk metrics.

Furthermore, instrument risk values are calculated and stored so that simple linear additive aggregation (i.e. summation) is possible in computing the aggregate risk values for the portfolio of interest, that fully preserves the risk characteristics of the instruments over the entire set of time steps and scenarios without approximation. This provides for greater efficiency and flexibility over prior art risk management systems (see e.g. p. 18, lines 16-22). This is in dramatic contrast to the methodologies used in some prior art risk management systems that store delta vectors (rather than calculations of risk values at the instrument level), which necessitates the use of co-variance matrices for re-aggregation rather than simple linear addition.

The Applicant respectfully submits that none of the cited art teaches or suggests a risk management system in which instrument risk values at each scenario and for each time interval are determined and stored, which are subsequently summed to produce aggregated risk values for a portfolio of interest, and where the aggregated risk values are then used to compute desired risk metrics.

For example, **Dembo** does not teach a method of determining and storing risk values at an instrument level, and is instead generally directed to means of generating optimal scenario sets. While **Dembo** relates generally to a scenario-based methodology, which can be applicable to risk management systems in certain implementations, **Dembo** does not specifically teach a scenario-based risk management system in which instrument risk values at each scenario and for each time interval are determined and stored, which are subsequently summed to produce aggregated risk values for a portfolio of interest, and where the aggregated risk values are then used to compute desired risk metrics.

Furthermore, **Moore et al.** is directed to a general information management system, and not to a risk management system in which risk analyses are

performed on the basis of possible scenarios under a plurality of time steps or intervals, each scenario being associated with a measure of the likelihood of its future occurrence. Scenario-based risk management systems are highly sophisticated when compared to other risk management systems that rely on the evaluation of models using only historical-based data, and have gained a distinct status in the art. Accordingly, it is respectfully submitted that general-purpose management information systems such as that described in **Moore et al.** would not be considered relevant to the present invention by a person skilled in the art, and could not be combined with **Dembo** in a manner that would permit a person skilled in the art to arrive at the present invention.

Moreover, the "instrument" that is stored and later re-used in **Moore et al.** is a "rule" or formula that can be customized by a user (see e.g. **Moore et al.**, column 1, lines 32-68; column 5 lines 29-63; Figure 5, etc.). Persons skilled in the art would understand that the rules are not financial instruments themselves; they do not combine to form portfolios, and cannot be used by an aggregation engine to generate desired risk metrics.

Similarly, **Ohata et al.** does not teach a risk management system in which instrument risk values at each scenario and for each time interval are determined and stored, which are subsequently summed to produce aggregated risk values for a portfolio of interest.

It is also noted that the assignee of the present invention, through a commercialization of an embodiment of the present invention now known as the "Mark-to-Future framework", was awarded a "Technological Development of the Year" award by Risk Magazine in 2000. The Applicant submits that this should be considered as objective evidence that the present invention was considered significantly novel and inventive over prior art approaches used in the field of risk management systems by persons skilled in the art.

Independent claims 1, 20 and 24 have been amended to clarify that the instruments being processed are financial instruments, and that at least one desired risk metric is produced by at least one aggregation engine adapted to retrieve for each financial instrument in a portfolio, stored instrument risk values for each scenario and for each time interval from the database; sum the retrieved instrument risk values at each scenario at each time interval to produce aggregated risk values for the portfolio; and compute the desired risk metric using the aggregated risk values for the portfolio. Support for this amendment can be found through the Applicants' specification (e.g. Figure 9 and p. 10 line 23 – p. 12 line 15; p. 13 lines 10-16). Claims 2-3, 8-9, 11, 17, 19, 21, 23, 25-27, and 29 have also been amended to recite terms consistent with the language of amended claims 1, 20 and 24. No new matter has been introduced by these amendments.

The Applicants submit that claims 1-29 are patentable over the cited art for the reasons provided above. Withdrawal of the Examiner's rejection is respectfully requested.

### **Preliminary Amendments**

A preliminary amendment was filed on June 1, 2001 and re-filed on August 17, 2001, in which a clerical error in the labeling of Figure 4 and its brief description was corrected. The Applicants respectfully request confirmation that this amendment has been recorded.

### **Amendments to the Specification**

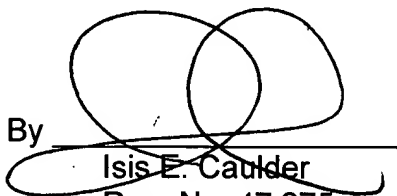
The present application is a continuation of application No. 09/323,680. Line 1 of the specification has been amended to specify the current status of application No. 09/323,680.

According to the duty of disclosure provisions discussed at MPEP §2001.06(b), the Examiner is to indicate whether prior art cited in a related earlier application has been reviewed. The Applicants respectfully request confirmation that the prior art cited in application No. 09/323,680 has been considered in the present application.

All objections and rejections have been addressed. It is respectfully submitted, therefore, that the present application is now in position for allowance, and a notice to that effect is earnestly solicited. If the Examiner believes that a telephone interview would expedite allowance of the application, he is respectfully requested to contact the undersigned.

Respectfully submitted,

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